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If the book has any weakness it is that it attempts too much. It presents such a vast array of principles, in so brief or concentrated a form, that there is danger of cloying the appetite, or producing mental dyspepsia. Some of the principles named are axiomatic and it seems scarcely necessary to repeat so much self-evident truth. In some cases non-essentials are emphasized and essentials are passed over slightly. By restricting the number of topics, and elucidating the more important principles, the probability of treating them to the average student's profit would be greatly increased.

A book treating of the principles of agriculture can scarcely be called complete which has nothing to say about exchange and distribution. If farming is a business, the machinery whereby the farmer converts into money, or other values, that portion of his products which is not consumed on his farm, and the principles concerned in such exchange, are nearly as important as those concerned in mere production.

It seldom happens that a book which is the joint product of so many different contributors possesses such a clear, vigorous and attractive style throughout as does this one. Scholarship and training are evident in every chapter.

If this book could be placed in the hands of each earnest young farmer, it could scarcely fail to give him a broader, truer conception of what farming really is, and would teach him that thought and study, observation and reflection are just as essential and serviceable upon the farm as elsewhere.

To all those who are resolved to be good farmers we commend this volume, because no man in this age can be a thoroughly good farmer without the knowledge which can be more easily and rapidly acquired here than elsewhere.—W. R. LAZENBY.

MINOR NOTICES.

THE "NEW EDITION" of Hansen's *Pflanzenphysiologie*, bearing date of 1898, seems to be only a re-issue of that well and favorably known book.⁴ It was primarily intended for that large circle of readers who are chiefly interested in some other field of science, but wish to have simple, accurate, and concise information concerning the fundamental facts and principles of plant life. This mission it fulfilled well. It would be wise to have the progress which has been made since 1890 embodied in a thoroughly revised edition. To those who do not already know and use the original edition, we commend it as presenting many points in a clear and interesting fashion, with happy citation of examples.—C. R. B.

THE SATISFACTORY reception which has been given to Russell's *Dairy*

⁴HANSEN, ADOLPH: *Pflanzenphysiologie. Die Lebenserscheinung und Lebensbedingungen der Pflanzen. Neue Ausgabe.* 8vo. pp. viii + 314. *figs. 160.* Giessen: J. Ricker'sche Buchhandlung. 1898.

*Bacteriology*⁵ has encouraged the author to prepare the fourth edition, which is a thorough revision of the third. The work is divided into three parts; first, the structure, form, physiology and methods of study of bacteria in general; second, the contamination and fermentation of milk, and the proper means of milk preservation; third, the relation of bacteria to milk products, as concerns both their desirable and undesirable effects.

The work is excellent in that it makes practical application of so much of the purely scientific work of bacteriology. It furnishes a further testimony to the mutual relation existing between research and practice. It seems, however, that the book should contain figures of those bacteria found in connection with dairying, which induce not only unfavorable conditions in milk, but also of those which induce diseases of men, since illustrations would better enable students of dairying to identify such organisms when present. It is quite noticeable that so important a work as the *Manual of Bacteriology* by Muir and Ritchie should be omitted from the author's list of works which "contain more or less complete descriptions of the various processes employed in studying bacteriology."

As a text upon dairy bacteriology the book fills a place not approached by any other work, as shown by the fact that it is now used in all the dairy schools of the United States and Canada. In addition to the interest in the book on the part of students of such schools, the subject is of so much importance to all users of milk and its products, and the book is so excellently written that it should be extensively recommended to all as a study in public hygiene.—OTIS W. CALDWELL.

NOTES FOR STUDENTS.

FASCICLES III and IV of the *Fungi Rossie Exsiccatae* contain a number of interesting Uredineæ collected by Mr. Komarov in Mantchuria, and included because the flora is similar to that of some of the Russian provinces. As the plants of that region are so closely related to those of eastern America, it was to be expected that some of our parasitic fungi would occur there. Accordingly we find *Puccinia Waldsteinia* Curt.; *P. halenia* Arth. & Halway, hitherto only known from northern Minnesota; a variety of *P. heuchera* (Schw.) Diet.; *P. mesomegala* Berk. & Curt.; *Æcidium Sambuci* Schw.; and *Uromyces lespedege* (Schw.) Pk.—E. W. D. H.

THE FEBRUARY number of *Natural Science* is an interesting, if not in all instances a gratifying, one to students of ecology, containing, among other things, papers on the study of plant associations by Robert Smith, mimetic resemblances in animals and plants by Professor Henslow, and bees and the origin of flowers by G. W. Bulman. The first is chiefly interesting because

⁵ RUSSELL, H. L.: Outlines of dairy bacteriology. 4th ed. pp. vi + 190. figs. 39. The Author, Madison, Wis., 1899.